Amendments to the Claims: This listing of claims will replace all prior versions, and listings, of claims in the application

1. (Currently Amended) An electro-optical switch, comprising:

a non-piezoelectric photonic crystal having first and second waveguides separated by a region of the photonic crystal, ~~each arranged in a plane therein and~~ each of the first and second waveguides having 1) a respective input portion and a respective output portion and 2) a coupling length where the first waveguide is proximate to the second waveguide~~,~~; and electrical means or optical means for inducing a change in conductance in the region of the photonic crystal along the coupling length, wherein the respective input portions are~~being~~ unconnected to each other, ~~wherein the first waveguide is adjacent to the second waveguide along a coupling length in the plane,~~ and ~~the~~a switch is configured such that the change in the conductance produces ~~in the plane along the coupling length resulting from an electro-optic effect in the coupling length provides~~ electro-optical switching between the first and second waveguides.

2. (Original) An electro-optical switch as recited in claim 1, wherein said photonic crystal comprises a periodic array of silicon pillars arranged in a square lattice.

3. (Original) An electro-optical switch as recited in claim 1, wherein said photonic crystal comprises a periodic array of air holes arranged in a hexagonal lattice.

4. (Currently Amended) An electro-optical switch as recited in claim 1, wherein the propagation constants of the first and second waveguides are ~~equivalent~~different.

5. (Currently Amended) An electro-optical switch as recited in claim 4, wherein the first and second waveguides electro-optically couple to each other ~~at all~~over a range of optical wavelengths.

6. (Currently Amended) An electro-optical switch as recited in claim 1, wherein the first and second waveguides are ~~identical~~different.

7. (Currently Amended) An electro-optical switch as recited in claim 6, wherein the first and second waveguides electro-optically couple to each other ~~at all~~over a range of optical wavelengths.

8. (Currently Amended) A photonic bandgap integrated circuit, comprising:

a non piezoelectric photonic crystal; and

an electro-optical switch formed by providing first and second waveguides in said photonic crystal ~~adjacent each other in a plane containing~~separated by a region of the photonic crystal and electrical means or optical means for inducing a change in conductance in the region of the photonic crystal along a coupling length, wherein ~~a~~ the integrated circuit is configured such that the change in the conductance ~~in the plane along the coupling length provides electro-optic effect in the coupling length provides~~produces electro-optical switching between the first and second waveguides,

wherein the first and second waveguides each have 1) a respective input portion and a respective output portion, the respective input portions being unconnected to each other and 2) the coupling length where the first waveguide is proximate to the second waveguide.

9. (Original) A photonic bandgap integrated circuit as recited in claim 8, wherein said photonic crystal comprises a periodic array of silicon pillars arranged in a square lattice.

10. (Original) A photonic bandgap integrated circuit as recited in claim 8, wherein said photonic crystal comprises a periodic array of air holes arranged in a hexagonal lattice.

11. (Currently Amended) A photonic bandgap integrated circuit as recited in claim 8, wherein the propagation constants of the first and second waveguides are different~~equivalent~~.

12. (Currently Amended) A photonic bandgap integrated circuit as recited in claim 11, wherein the first and second waveguides electro-optically couple to each other ~~at all~~ over a range of optical wavelengths.

13. (Currently Amended) A photonic bandgap integrated circuit as recited in claim 8, wherein the first and second waveguides are ~~identical~~different.

14. (Currently Amended) A photonic bandgap integrated circuit as recited in claim 13, wherein the first and second waveguides electro-optically couple to each other ~~at all~~ over a range optical wavelengths.

15. (Currently Amended) A coupled photonic crystal waveguided system, comprising:

first and second photonic bandgap waveguides separated by a region of ~~provided adjacent to each other in a plane containing~~ a non piezoelectric ~~coupling length~~photonic crystal; and

electrical means or optical means for inducing a change in conductance in the region of the photonic crystal along a coupling length, wherein ~~a~~ the system is configured such that the change in the conductance ~~in the plane along the coupling length provides~~ produces electro-optical switching between said first and second photonic bandgap waveguides,

wherein the first and second waveguides each have a 1) respective input portion and a respective output portion, the respetive input portions being unconnected to each other and 2) the coupling length where the first waveguide is proximate to the second waveguide.

16. (Original) A coupled photonic crystal waveguided system as recited in claim 15, wherein the photonic crystal comprises a periodic array of silicon pillars arranged in a square lattice.

17. (Original) A coupled photonic crystal waveguided system as recited in claim 15, wherein the photonic crystal comprises a periodic array of air holes arranged in a hexagonal lattice.

18. (Currently Amended) A coupled photonic crystal waveguided system as recited in claim 15, wherein the propagation constants of said first and second photonic bandgap waveguides are ~~equivalent~~different.

19. (Currently Amended) A coupled photonic crystal waveguided system as recited in claim 18, wherein said first and second photonic bandgap waveguides electro-optically couple to each other ~~at all~~ over a range of optical wavelengths.

20. (Currently Amended) A coupled photonic crystal waveguided system as recited in claim 15, wherein said first and second photonic bandgap waveguides are ~~identical~~different.

21. (Currently Amended) A coupled photonic crystal waveguided system as recited in claim 20, wherein said first and second photonic bandgap waveguides electro-optically couple to each other ~~at all~~ over a range of optical wavelengths.

22. (Currently Amended) A method for providing an electro-optical switch, comprising:

providing a non-piezoelectric photonic crystal;

providing first and second waveguides in the photonic crystal ~~adjacent to each other in a~~separated by a region of the photonic crystal, ~~plane along~~ each of the first and second waveguides having a coupling length where the first waveguide is proximate to the second waveguide; and

inducing a change in ~~changing the~~ conductance in ~~the plane along the coupling length to provide~~ the region of the photonic crystal along the coupling length to produce electro-optical switching between the first and second waveguides,

~~wherein said changing a conductance is accomplished is accomplished by an electro-optic effect within the coupling length,~~ wherein the first and second waveguides each have a respective input portion and a respective output portion, the respective input portions being unconnected to each other.

23. (Original) A method for providing an electro-optical switch as recited in claim 22, wherein the photonic crystal comprises a periodic array of silicon pillars arranged in a square lattice.

24. (Original) A method for providing an electro-optical switch as recited in claim 22, wherein the photonic crystal comprises a periodic array of air holes arranged in a hexagonal lattice.

25. (Currently Amended) A method for providing an electro-optical switch as recited in claim 22, wherein the propagation constants of the first and second waveguides are ~~equivalent~~different.

26. (Currently Amended) A method for providing an electro-optical switch as recited in claim 25, wherein the first and second waveguides electro-optically couple to each other ~~at all~~ over a range of optical wavelengths.

27. (Currently Amended) A method for providing an electro-optical switch as recited in claim 22, wherein the first and second waveguides are ~~identical~~different.

28. (Currently Amended) A method for providing an electro-optical switch as recited in claim 27, wherein the first and second waveguides electro-optically couple to each other ~~at all~~over a range of optical wavelengths.

29. (Previously Presented) The electro-optical switch of claim 1, wherein the change in conductance along the coupling length is induced by electrical carrier injection provided by a forward-biased PN junction.

30. (Currently Amended) An electro-optical switch, comprising:

a non-piezoelectric photonic crystal having first and second waveguides separated by a region of the photonic crystal~~provided each arranged in a plane therein~~, wherein ~~the~~ each of the first waveguide ~~is adjacent to~~ and the second waveguide ~~along~~ have a coupling length where the first waveguide is proximate to the second waveguide; and means for inducing a change in conductance in the region of the photonic crystal along the coupling length, wherein ~~in the plane and a~~ the switch is configured such that the change in the conductance ~~in the plane along the coupling length resulting from an electro-optic effect in the coupling length provides~~ produces electro-optical switching between the first and second waveguide,

wherein the change in conductance along the coupling length is optically induced by electron-hole pair generation.

31. (Currently Amended) The electro-optical switch of claim 1, ~~further comprising~~ wherein the electrical or optical means is configured to modulate ~~for modulating~~ a coupling coefficient between the first and second waveguides.

32. (Previously Presented) The photonic bandgap integrated circuit of claim 8, wherein the change in conductance along the coupling length is induced by electrical carrier injection provided by a forward-biased PN junction.

33. (Currently Amended) A photonic bandgap integrated circuit, comprising:

a non-piezoelectric photonic crystal; and

an electro-optical switch formed by providing first and second waveguides in said photonic crystal separated by a region of the photonic crystal and means for inducing a change in conductance in the region of the photonic crystal along~~adjacent each other along in a plane containing~~ a coupling length, wherein ~~a~~ the integrated circuit is configured such that the change in the conductance ~~in the plane along the coupling length resulting from an electro-optic effect in the coupling length provides~~ produces electro-optical switching between the first and second waveguides,

wherein the change in conductance along the coupling length is optically induced by electron-hole pair generation and

the first waveguide is proximate to the second waveguide along the coupling length.

34. (Currently Amended) The photonic bandgap integrated circuit of claim 8, ~~further comprising~~wherein the electrical or optical means is configured to modulate~~for modulat~~es~~ing~~ a coupling coefficient between the first and second waveguides.

35. (Previously presented) The coupled photonic crystal waveguided system of claim 15, wherein the change in conductance along the coupling length is induced by electrical carrier injection provided by a forward-biased PN junction.

36. (Currently Amended) A coupled photonic crystal waveguided system, comprising:

first and second photonic bandgap waveguides ~~provided adjacent to each other along in a plane containing~~ separated by a region of a non-piezoelectric ~~coupling length~~photonic crystal; and means for inducing a change in conductance in the region of the photonic crystal along a coupling length, wherein ~~a~~ the system is configured such that the change in ~~a~~ the conductance ~~in the plane along the coupling length resulting from an electro-optic effect in the coupling length provides~~ produces electro-optical switching between said first and second photonic bandgap waveguides,

wherein the change in conductance along the coupling length is induced optically by electron-hole pair generation, and

the first waveguide is proximate to the second waveguide along the coupling length.

37. (Currently Amended) The coupled photonic crystal waveguided system of claim 15 ~~further comprising an~~wherein the electrical or optical means is configured to modulate~~for modulating~~ a coupling coefficient along the coupling length.

38. (Previously Presented) The method for providing an electro-optical switch of claim 22, wherein said changing the conductance along the coupling length comprises injecting electrical carriers provided by a forward-biased PN junction.

39. (Currently Amended) A method for providing an electro-optical switch, comprising:

providing a non-piezoelectric photonic crystal;

providing first and second waveguides in the photonic crystal separated by a region of the photonic crystal, each of the first and second waveguides having ~~adjacent to each other in a plane along~~ a coupling length where the first waveguide is proximate to the second waveguide; and

~~changing a~~ inducing a change in conductance ~~in the plane along the coupling length to provide~~ in the region of the photonic crystal along the coupling length to produce electro-optical switching between the first and second waveguides,

~~wherein said changing a conductance is accomplished by an electro-optic effect within the coupling length,~~

wherein said changing the conductance along the coupling length comprises optically inducing electron-hole pair generation.

40. (Previously presented) The method for providing an electro-optical switch of claim 22, wherein said changing the conductance along the coupling length comprises modulating a coupling coefficient between the first and second waveguides.

41. (Previously Presented) The method for providing an electro-optical switch of claim 22, wherein said changing the conductance along the coupling length comprises changing an optical absorption along the coupling length.